

REMARKS

Claims 8-28 have been cancelled. Claims 1-3 and 7 have been amended. Thus, claims 1-7 remain pending in the present application. No new matter has been added.

The Examiner has based several objections and rejections on the limitation in claim 1 of “the flow control membrane including a mounting portion at which the flow control membrane is coupled to the housing....” According to the Examiner, the drawings do not show the “mounting portion,” the specification provides no support for it, and its recitation in the claim violates the written description requirement under 35 U.S.C. § 112, ¶1, and is indefinite under 35 U.S.C. § 112, ¶2.

Applicants have amended the claims to replace the term “mounting portion” with “seating portion.” Support for this amendment is found at least in paragraph [0030] of the specification, which states that “*fwlhen mounted in a valve housing 30*, the flow control membrane 102 rests on a membrane seat 50 as shown in FIG. 1. More specifically, *a seating portion 108 of the membrane 102 is seated on the membrane seat 50*, which is generally annular in shape.” (Emphasis added) (reference is to the published version of the application). Seating portion 108 is shown in Figures 2 and 3, and the mounting relationship between seating portion 108 and membrane seat 50 of housing 30 is shown in Figure 1. Thus, in view of this amendment and discussion, Applicants respectfully submit that the term “seating portion” is adequately shown in the drawing, finds sufficient support in the specification, and is recited in the claims in such a way as to be understood by those of ordinary skill in the art. Accordingly, withdrawal of the above-referenced objections and rejections is respectfully requested.

Claims 1-4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,205,834 to Moorehead in view of U.S. Patent No. 3,811,466 to Ohringer. The Examiner relies on Ohringer to show the limitation “wherein the mounting portion covers a minority of a surface area of the lumen occluding portion in which the slit is disposed.” The Examiner needs Ohringer because the Examiner concedes that in Moorehead, a majority, not minority, of a surface area of a diaphragm 124 is covered by a disc 120. This is so because of the small size of an opening 132 of the disc 120 in relation to the overall surface area of the disc 120. In the Response to Arguments section of the current office action, the Examiner argues that (1) Ohringer teaches varying the diameter d3 of a control plate 19, (2) the teaching of Ohringer can be viewed as a teaching to vary the diameter of an opening around a slit of an adjacent membrane, and (3) therefore, analogously, the teaching of Ohringer supports enlarging the

diameter of the opening 132 of the disc 120 in Moorehead to such an extent that only a minority of adjacent the diaphragm 124 (regarded as meeting the “flow control membrane”) is covered by the surface of disc 120.

Applicants disagree with this analysis. With all due respect, Ohringer does not support enlarging the opening 132 of the disc 120 in Moorehead to the extent necessary to meet the claim limitation. In Ohringer, a worry is the tearing of a slit 31 of a diaphragm 17 that may occur due to a powerful flow of fluid therethrough. The likelihood of tearing increases if an opening 33 of an adjacent control plate 19 is large enough that the entire length of the slit 31 is exposed to the fluid flow. Specifically, Ohringer states that “[t]he length L1 [of the slit 31 in disc 124] is preferably the same as, or longer than, the inside diameter d1 of flange 13. This is because if L1 is lesser than d1, the slit has a tendency of tearing at the ends after a certain duration use.” Column 2, lines 39-43. Therefore, a correct application of the Ohringer teaching to Moorehead would be mindful of this limitation, since Moorehead also employs a slit diaphragm 124 that is presumably vulnerable to the type of tearing noted by Ohringer. A person of ordinary skill, then, would understand that Ohringer would not support expanding the diameter of the opening 132 in Moorehead to such an extent that the full length of the slit in the adjacent diaphragm 124 would be exposed to the fluid flow. If Ohringer does not support expanding the diameter of the opening 132 to completely expose the slit of diaphragm 124 in Moorehead, then, given the dimensions of these elements as depicted in the drawings, Ohringer does not support expanding the opening 132 to an extent that would cause only a minority of a diaphragm 124 to be covered by the disc 120.

Even if Ohringer did not explicitly limit the extent to which an opening of a disc could be expanded, the modification to the opening 132 of the disc 120 as proposed by the Examiner still would not find any support. In Ohringer, the purpose of expanding the size of the opening d3 is to increase the portion of the slit 31 exposed to a fluid flow. Column 2, lines 50-51. Thus, Ohringer supports expanding the size of the opening d3 only up to the point where opening d3 completely exposes the slit. Any further expansion would be superfluous with respect to the flow control purpose and thus unsupported. In applying this teaching to Moorehead in a manner consistent with Ohringer, the maximum extent to which one of ordinary skill in the art would expand the opening 132 would be to fully expose the slit 146 in a diaphragm 124. Given the small size of the slit 142 relative to the diameter of the disc 120, one of ordinary skill in the art could expand the opening 132 of the disc 120 to completely expose slit 146 without expanding it enough so that only a minority of the diaphragm 124 would be covered by the disc 120. Any further expansion of the opening 132 beyond the point needed to expose more of the slit 146 would be unrelated to fluid flow control and thus outside the bounds of the Ohringer teaching.

Another reason why claim 1 is patentable over the combination of Moorehead with Ohringer is based on the limitation “the flow control membrane including a seating portion *at which the flow control membrane is coupled to the housing...*” This cannot be met by either Moorehead or Ohringer because in both of these references their respective slit diaphragms are pressed against an adjacent disc, not a housing. This limitation quoted above requires the “seating portion” to be “coupled to the housing.” If, as is the case with the two references, the purported “flow control membrane” (the slit diaphragm 124 in Moorehead and the slit diaphragm 17 in Ohringer) of these references rests against only an adjacent disc (the control plate 19 in Ohringer and the flex control disc 120 in Moorehead), then no portion of the purported “flow control membrane” of these references can be correctly said to be “coupled to the purported “housing” (e.g., valve housing parts 44, 46 of housing 42 in Moorehead).

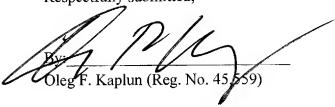
Accordingly, for at least these reasons, claim 1 is patentable over the combination of Moorehead and Ohringer. As for claims 2-4, these claims are patentable for at least the same reasons given in support of claim 1.

Claims 5-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Moorehead in view of U.S. Patent No. 5,944,698 to Fischer et al. Since Fischer does not overcome the deficiencies noted above with respect to Moorehead, Applicants submit that claims 5-7 are patentable for at least the same reasons given above.

In light of the foregoing, Applicants respectfully submit that all of the pending claims are in condition for allowance. All issues raised by the Examiner having been addressed, an early and favorable action on the merits is earnestly solicited.

Respectfully submitted,

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